

UNITED STATES PATENT AND TRADEMARK OFFICE

In re U.S. Patent Application of

HIGAKI et al.

Application Number: 10/768,439

Filed: February 2, 2004

**For: STORAGE SYSTEM AND
STORAGE CONTROL DEVICE**

Attorney Docket No. HIT A.0508

Art Unit 2186

**Honorable Assistant Commissioner
for Patents
Washington, D.C. 20231**

PETITION TO MAKE SPECIAL UNDER 37 C.F.R. § 1.102(d)
FOR ACCELERATED EXAMINATION

Sir:

Pursuant to 37 C.F.R. § 1.102(d), Applicant respectfully requests the application to be examined on the merits in conjunction with the pre-examination search results, the detailed discussion of the relevance of the results and amendments as filed concurrently.

Substantive consideration of the claims is respectfully solicited. Should there be any outstanding issues requiring discussion that would further the prosecution and allowance of the above-captioned application, the Examiner is invited to contact the Applicant's undersigned representative at the address and telephone number indicated below.

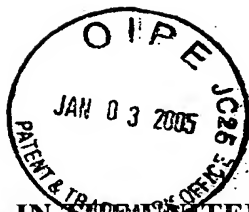
Respectfully submitted,

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STATEMENTS & PRE-EXAMINATION SEARCH REPORT
SUPPLEMENTAL TO
THE PETITION TO MAKE SPECIAL

Sir:

Pursuant to 37 C.F.R. §§ 1.102 and MPEP 708.02 VIII, Applicant hereby submits that (1) all claims of record are directed to a single invention, or if the Office determines that all the claims presented are not obviously directed to a single invention, will make an election without traverse as a prerequisite to the grant of special status; (2) a pre-examination search has been conducted according to the following field of search; (3) copies of each reference deemed most closely related to the subject matter encompassed by the claims are enclosed; and (4) a detailed discussion of the references pointing out how the claimed subject matter is patentable over the references is also enclosed herewith.

FIELD OF THE SEARCH

The field of search covered Class 711, subclasses 111 (U.S. & Foreign) and 112 (U.S. & Foreign). Additionally, Additionally, a computer database search was conducted on the USPTO systems EAST and WEST for U.S. and foreign patents; a keyword search was conducted in Class 707, subclasses 202 and 203; Class 711, subclasses 113, 114, 147, 163 and 165; and a literature search was also conducted on the internet and commercial databases

for relevant non-patent documents. Examiner Reginald Bragdon in Class 711 (Art Unit 2188) was consulted in confirming the field of search.

The search was directed towards a storage system and storage control device. In particular, the search was directed a storage system/methods comprising a first storage control device and a second storage control device connected so as to be capable of communicating with each other and executing data processing according to a request from a host device, wherein the first storage control device comprise; first control means for judging whether or not the second storage control device can execute a predetermined data processing relating to a first request received from the host device and, when it is judged that the second control device can execute, generating a second request corresponding to the first request and transmitting it to the second storage control device, wherein the second storage control device comprises; a second control means for executing the predetermined data processing based on the second request received from the first storage control device, and as further claimed in the disclosure.

LIST OF RELEVANT REFERENCES

The search revealed the following U.S. patents, which are listed for convenience:

<u>U.S. Patent Number</u>	<u>Inventor(s)</u>
6,353,878	Dunham
6,366,987	Tzelnic et al.
6,502,205	Yanai et al.
6,779,093	Gupta

<u>Published Patent Application</u>	<u>Inventor(s)</u>
2002/0103980	Crockett et al.
2003/0217119	Raman et al.
2003/0221077	Ohno et al.
2004/0073831	Yanai et al.
2004/0103261	Honda et al.

2004/0139124

Kawamura et al.

2004/0193795

Takeda et al.

Foreign Patent Number

Inventor(s)

JP 2004-151761

Uchiumi et al.

Discussion of References:

US Pat. App. Pub. No. 2003/0221077 of **Ohno** (Fig. 1) shows a method for controlling a storage system including a host computer 30, and a first and a second storage control apparatuses 10, 20 comprising; connecting a first communication path between a host computer 30 and the first storage control apparatus 10 to each other; connecting a second communication path between the first storage control apparatus 10 and the second storage control apparatus 20 to each other; receiving by the first storage control apparatus 10 a first data input/output request transmitted from the host computer 30 through the first communication path; judging by the first storage control apparatus 10 whether a first command contained in the first data input/output request is a command that the second storage control apparatus 20 can execute or not by analyzing the first command. If the first storage control apparatus 10 judges that the command is a command that the second storage control apparatus 20 cannot execute, the first storage control apparatus 10 creates a second command that the second storage control apparatus 20 can execute (e.g., claim 31). In contact, if the first control means of the invention judges that the second control device can execute a predetermined data processing function relating to a first request received from the host device, it generates a second request corresponding to the first request and transmitting it to the second storage control device. **Ohno** actually teaches away from the invention as now recited in claim 1.

US Pat. App. Pub. No. 2004/0193795 of **Takeda** (Fig. 1) shows a storage system, which manages a plurality of storage control apparatus in an integrated manner. A control method adopted by the storage system allows the first storage control apparatus 2 to receive a data write or read command from a host apparatus 1; determining whether the data write or read command received from the host apparatus 1 is to be executed by a data operation

involving the first storage device 3 or a data operation involving the second storage device 4 based upon management information in the first storage control apparatus 2; and writing data into the first storage device 3 or the second storage device 4 or reading out data from the first storage device 3 or the second storage device 4 based upon the step of determining (claims 1-13; paragraphs [0032]-[0037]). However, **Takeda's** first storage control apparatus 2 merely judges "*whether or not a logical volume specified in an I/O write request made by the host apparatus 1 forms a pair of logical devices with another logical volume. If a logical volume specified in an I/O write request issued by the host apparatus 1 forms a pair of logical devices with another logical volume, data written into the logical volume specified in an I/O write request is also written into the other logical volume as well* (paragraph [0037])". **Takeda's** first storage control apparatus 2 does NOT judge "whether or not the second storage control device can execute a predetermined data processing function relating to a first request received from the host device and, when it is judged that the second control device can execute, generating a second request corresponding to the first request and transmitting it to the second storage control device" "such that the second storage control device takes over said predetermined data processing function relating to a first request from the first storage control device" as now recited in claim 1.

US Pat. App. Pub. No. 2004/0073831 of **Yanai** et al. shows a system which controls storing of primary data received from a primary host computer 12 on a primary data storage system 14 with a preliminary data storage system controller 16 (paragraph [0062]), and additionally controls the copying of the primary data to a secondary data storage system 46 with a secondary data storage system controller 44 (paragraph [0066]; claim 1). **Yanai**, at most, denies "direct write access to a secondary (R2) volume if it judges that remote mirroring is not suspended. If it judges that remote mirroring is suspended, it still denies direct write access to the secondary volume if a "sync required" attribute is set for the volume and the volume is not synchronized (paragraph [0025]). **Yanai** does NOT judge "whether or not the second storage control device can execute a predetermined data processing function relating to a first request received from the host device and, when it is judged that the second control device can execute, generating a second request corresponding to the first request and transmitting it to the second storage control device" "such that the second storage control device takes over said predetermined data processing function relating to a first request from the first storage control device" as now recited in claim 1.

U.S. Patent Numbers 6,353,878 (Dunham), 6,366,987 (Tzelnic et al.), 6,502,205 (Yanai et al.), 6,779,093 (Gupta), U.S. Patent Application Numbers 2002/0103980 (Crockett et al.), 2003/0217119 (Raman et al.), 2004/0103261 (Honda et al.), 2004/0139124 (Kawamura et al.) and Japanese Patent Number 2004/151761 (Uchiumi et al.) merely show a storage system comprising a first and second control device connected to communicate with each other and executing data processing. None of them judges “whether or not the second storage control device can execute a predetermined data processing function relating to a first request received from the host device and, when it is judged that the second control device can execute, generating a second request corresponding to the first request and transmitting it to the second storage control device” “such that the second storage control device takes over said predetermined data processing function relating to a first request from the first storage control device” as now recited in claim 1.

CONCLUSION

Based on the results of the comprehensive prior art search as discussed above, Applicants contend that the position calculation method as now recited in independent claims 1 and 14-16, especially the features of “a first storage control device judging whether or not the second storage control device can execute a predetermined data processing function relating to a first request received from the host device and, when it is judged that the second control device can execute, generating a second request corresponding to the first request and transmitting it to the second storage control device” “such that the second storage control device takes over said predetermined data processing function relating to a first request from the first storage control device” are patentably distinct from the cited prior art references.

In particular, as now recited in the claim 1, a storage system (e.g., Fig. 1; pp. 38-40) comprising a first storage control device 10 and a second storage control device 200 connected so as to be capable of communicating with each other and executing data processing according to a request from a host device 1. The first storage control device 10 comprises first control means for judging whether or not the second storage control device 200 can execute a predetermined data processing function relating to a first request CH received from the host device 1 and, when it is judged that the second control device 200 can execute, generating a second request CS corresponding to the first request CH and transmitting it to the second storage control device 200. The second storage control device

200 comprises second control means for executing the predetermined data processing function based on the second request CS received from the first storage control device 10 such that the second storage control device 200 takes over said predetermined data processing function relating to a first request CH from the first storage control device 10 (e.g., *"When the command control unit 100 makes reference to the function management table TF and confirms that the second storage control device 200 supports the direct backup function, the command control unit 100 generates the second command CS by rewriting part of the first command CH in order to make the second storage control device 200 take over the direct backup."* p. 52, lines 7-8). The predetermined data processing function includes direct backup, internal copying process between a pair of volumes, mirroring, or remote copying (p. 51, lines 20-22).

The invention recited in claim 14 is directed to a control method for a storage system comprising a first storage control device and a second storage control device connected to communicate with each other thereby executing data processing according to requests from a host device to operate as recited in claim 1.

The invention recited in claim 15 is directed to the first storage control device 10 as recited in claim 1 connected to a second storage control device 200 and a host device 1 to communicate with each other for executing data processing according to a request from the host device 1 as recited in claim 1.

The invention recited in claim 16 is directed to a program stored in a computer readable medium connected to a second storage control device 200 and a host device 1 to communicate with each other for controlling a first storage control device 10 thereby executing data processing according to a request from the host device 1 as recited in claim 1.

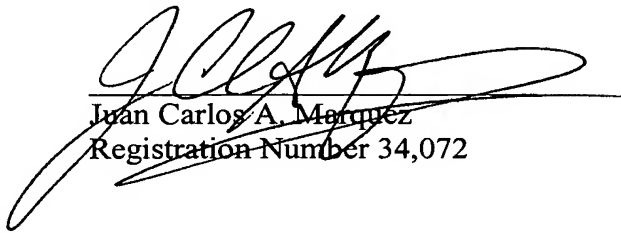
In view of all the above, clear and distinct differences as discussed exist between the present invention as now claimed and the prior art references, Applicant respectfully contends that the prior art references cannot anticipate the present invention or render the present invention obvious. Rather, the present invention as a whole is distinguishable, and thereby allowable over the prior art.

Favorable consideration of this application is respectfully solicited. Should there be any outstanding issues requiring discussion that would further the prosecution and allowance

of the above-captioned application, the Examiner is invited to contact the Applicant's undersigned representative at the address and phone number indicated below.

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